Jan Reimann — Curriculum Vitae

Assistant Professor
Pennsylvania State University
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EDUCATION

Dr. rer. nat. (PhD) in Mathematics, University of Heidelberg, Germany 2004
Thesis: *Computability and Fractal Dimension*
(grade: magna cum laude)

Diploma in Mathematics, University of Heidelberg, Germany 1997
Thesis: *Topologische Spiele und resourcenbeschränkte Baire-Kategorie*
(grade: sehr gut, 1.2)

AWARDS AND HONORS

Don Rung Teaching Award 2015
Department of Mathematics, Pennsylvania State University

Distinguished Teaching Award, Department of Mathematics, UC Berkeley 2009

Doktorandenkolloquium, German Association for Mathematical Logic and Foundations of the Exact Sciences (DVMLG) 2004
(awarded to the two best German PhD students in Logic each year)

RESEARCH SUPPORT

Center for Online Innovation in Learning (COIL), RIG 2016-2018
Pennsylvania State University ($39,644)

National Science Foundation Award DMS-1201263 ($91,693) 2012-2015
"*Computability and Randomness in Dynamical Systems and Fractal Geometry*"

National Science Foundation Award DMS-0801270 ($59,095) 2008-2010
"*Randomness in Recursion Theory and Effective Descriptive Set Theory*"

John Templeton Foundation, Grant 13424 ($100,000) 2008-2010
"*Randomness and the Infinite*" (with T. Slaman, Berkeley)

PROFESSIONAL EXPERIENCE

Associate Professor, 2017-present
Department of Mathematics, Pennsylvania State University, University Park

Assistant Professor, 2010-2017
Department of Mathematics, Pennsylvania State University, University Park

Morrey Assistant Professor, 2007-2010
Department of Mathematics, University of California, Berkeley

Visiting Assistant Professor, 2006-2007
Department of Mathematics, University of California, Berkeley

Wissenschaftlicher Assistent (Research Assistant, C1), 2004-2007
Institute for Computer Science, University of Heidelberg, Germany

Wissenschaftlicher Mitarbeiter (BAT IIa), 2001-2004
Institute for Mathematics, University of Heidelberg, Germany

Instructor for Statistical Quality Assurance, 1998-2001
Robert Bosch GmbH, Germany

Software developer, 1996-1998
SAP AG Walldorf, Germany,

RESEARCH INTERESTS

Algorithmic Information Theory and Randomness, Computability, Mathematical Logic, Measure Theory and Fractal Geometry, Descriptive Set Theory, Diophantine Approximation, Graph Limits, Ramsey Theory, Applications to Engineering and Seismology

INVITED VISITS: (LONGER THAN ONE MONTH)

Hausdorff Research Institute for Mathematics, Bonn, Germany, 2013
Program on *Universality and Homogeneity*
(visit cancelled for personal reasons)

University of Chicago, 2007
Prof. Denis Hirschfeldt and Prof. Robert Soare

National University of Singapore, 2005
IMS Program on Computational Prospects of Infinity

University of California, Berkeley, 2005
Prof. Theodore A. Slaman

Victoria University of Wellington, 2003
Prof. Rod Downey

INVITED TALKS

Department of Mathematics Colloquium, George Washington University 2017

South Eastern Logic Symposium 2017, Gainesville, Florida 2017
Plenary Talk

Workshop on "Normal Numbers: Arithmetic, Computational 2016
and Probabilistic Aspects", ESI Vienna

Conference "Reimagining Calculus Education", Stevens Inst. Tech. 2016
Plenary Talk

Department of Mathematics, University of Illinois Chicago 2016
Logic Seminar

South Eastern Logic Symposium 2016, Gainesville, Florida 2016
Plenary Talk

Central Fall Sectional Meeting, American Mathematical Society, Chicago 2015

UCLA Summer School in Logic 2015

Conference *Varieties of Algorithmic Information,* Heidelberg, Germany 2015
Plenary Talk

IMS National University of Singapore, Singapore 2015
Special Program on *Sets and Computations*

Department of Mathematics Colloquium, University of San Francisco 2015

Penn State Brandywine, Spring Speaker Series 2015

Winter meeting of the Canadian Mathematical Society, Hamilton, ON, Canada 2014
Special Session on *Computability Theory*,

Department of Mathematics, Gonzaga University, Spokane, Washington 2014

NII-Shonan Meeting on Algorithmic Randomness and Complexity 2014

Mini-Course on Algorithmic Randomness, Shanghai, China 2014
BASICS Summer School, Shanghai Jiao-Tong University

Conference on Computability, Complexity, and Randomness (CCR 2014) 2014
IMS Singapore, Singapore

Department of Mathematics, Bloomsburg University, Bloomsburg, PA 2014
Department of Mathematics Colloquium

Computability Theory and Foundations of Mathematics (CTFM) 2014, 2014
Tokyo, Japan, Plenary Talk

University of California at Berkeley, Berkeley, California 2014
Berkeley Logic Colloquium

Joint Mathematics Meetings, Baltimore, MD 2014
Special Session on *Logic and Probability*

Department of Mathematics, University of Florida, Gainesville, FL 2013
Departmental Colloquium and Logic Seminar

AMS Fall Central Sectional Meeting, Washington University, St. Louis, MO 2013
Special Session on *Computability across Mathematics*

Conference on *Computability, Complexity, and Randomness* (CCR) 2013
Moscow, Russia, Plenary Talk (cancelled due to illness in family)

UCLA Summer School in Logic 2013
(cancelled due to illness in family)

Department of Mathematics, Rutgers University 2013
Logic Seminar

University of Connecticut, Storrs, CT 2012
Logic Group Seminar

AMS 2012 Spring Eastern Sectional Meeting, George Washington University 2012
Special Session on *Computable Mathematics*

Mid-Atlantic Mathematical Logic Seminar (MAMLS), CUNY, New York, NY 2012

Workshop on Recursion Theory, IMS National University of Singapore 2011

Logic Colloquium 2011, Barcelona, Spain 2011
Plenary Talk

AMS Fall Central Section Meeting, University of Notre Dame, South Bend, IN 2010
Special Session on *Computability and its Applications*

Colloquium Logicum 2010, Münster, Germany 2010
Plenary Talk

Logic Seminar, Caltech/UCLA 2010

5th Conference on Logic, Computability and Randomness, 2010
University of Notre Dame, South Bend, IN
Plenary Talk

14th South Eastern Logic Symposium (SEALS), Gainesville, Florida 2010
Plenary Talk

MIT Logic Seminar, Cambridge, MA 2010

Workshop on Computability Theory 2010, Ponta Delgada, Azores 2010

14th South Eastern Logic Symposium (SEALS), Gainesville, Florida 2010
Plenary Talk

Association for Symbolic Logic Annual Meeting, University of Notre Dame 2009
Special Session on *Computability Theory*

Logic Colloquium, University of Wisconsin, Madison 2009

Logic Seminar, Department of Mathematics, National University of Singapore 2008

Mini-Course on Randomness in Logic, Hamburg, Germany 2008
European Summer School in Logic, Language and Information (ESSLLI)

Conference on *Computability, Complexity, and Randomness*, Nanjing, China 2008
Plenary Talk

Department of Mathematics Colloquium, University of Hawaii, Manoa 2008

Association for Symbolic Logic Winter Meeting, San Diego 2008
Plenary Talk

Conference *VIG* 2008, UCLA, Los Angeles 2008
Plenary Talk

Joint Meeting AMS and NZMS, Wellington, New Zealand 2007
Special Session on *Computability Theory*

Conference on *Logic, Randomness, and Computability*, Buenos Aires, Argentina 2007

UCLA Logic Colloquium, Los Angeles 2007

Logic Seminar, Department of Mathematics, University of Chicago 2006

Logic Seminar, Department of Mathematics, University of Notre Dame 2006

Logic Colloquium 2006, Nijmegen, The Netherlands 2006
Special Session on *Computability Theory*

Conference *Theory and Applications of Models of Computation*, Beijing, China 2006
Session on *Computability*

Logic Colloquium, Department of Mathematics, UC Berkeley 2006

Logic Seminar, Department of Mathematics, National University of Singapore 2005

Workshop on *Computational Prospects of Infinity*, IMS Singapore 2005

Association for Symbolic Logic Annual Meeting, Stanford University 2005
Special Session on *Computability and Randomness*

Department of Computer Science Colloquium, University of Halle, Germany 2005

Conference on *Logic, Randomness, and Computability*, Cordoba, Argentina 2004
Plenary Talk

Colloquium Logicum, Heidelberg, Germany 2004

School of Mathematics and Computer Science Colloquium 2004
Victoria University of Wellington, New Zealand

Max-Planck-Institut für Mathematik, Bonn, Germany 2004

Conference on *Computability and Logic*, Heidelberg, Germany 2003

CONTRIBUTED TALKS

C. Freer and J. Reimann, The topology of universal graphons 2015
Computability and Complexity in Analysis 2015.

B. Kjos-Hanssen and J. Reimann. The strength of the Besicovitch-Davies Theorem.
Computability in Europe (CiE) 2010, Ponta Delgada, Azores 2010
Accepted Papers Sessions

R. G. Downey, W. Merkle, and J. Reimann. Schnorr dimension. 2005
Conference on Computability in Europe 2005
Accepted Papers Sessions

W. Merkle, J. Miller, A. Nies, J. Reimann, and F. Stephan. Kolmogorov-Loveland randomness and stochasticity. 2005
STACS 2005, Accepted Papers Sessions

K. Ambos-Spies, W. Merkle, J. Reimann, and F. Stephan. Hausdorff dimension in exponential time. 2001
16th Annual IEEE Conference on Computational Complexity
Accepted Papers Sessions

K. Ambos-Spies, W. Merkle, J. Reimann, S. A. Terwijn. Almost complete sets. 2000
STACS 2000, Accepted Papers Sessions

PEER-REVIEWED PUBLICATIONS IN JOURNALS AND VOLUMES

D. K. Jha, A. Ray, J. Reimann, A. Srivastav, and N. Virani. Symbolic Analysis-based Reduced Order Markov Modeling of Time Series Data. Accepted for publication in *Signal Processing.*
(https://arxiv.org/abs/1709.09274)

V. Becher, J. Reimann, and T. A. Slaman. Irrationality Exponent, Hausdorff Dimension and Effectivization. Accepted for publication in *Monatshefte für Mathematik.*
(http://arxiv.org/abs/1601.00153)

J. Reimann and T. A. Slaman. Measures and their random reals. *Transactions of the AMS 367*(7): 5081–5097, 2015.

A. Day and J. Reimann, Independence, relative randomness and PA degrees. *Notre Dame Journal of Formal Logic* 55(1):1–10, 2014.

B. Kjos-Hanssen and J. Reimann. The strength of the Besicovitch-Davies Theorem. *Computability in Europe 2010*, Lecture Notes in Computer Science, pp. 229–238, Berlin, 2010. Springer.

J. Reimann. Randomness beyond Lebesgue measure. *Logic Colloquium 2006*, Cambridge University Press, 2009.

J. Reimann. Effectively closed classes of measures and randomness. *Annals of Pure and Applied Logic* 156(1), pp 170–182, 2008.

A. Nies and J. Reimann. A lower cone in the wtt degrees of non-integral effective dimension. *Computational prospects of infinity*, Part II. Institute for Mathematical Sciences, National University of Singapore, 15. World Scientific Publishing, 2008.

R. G. Downey, W. Merkle, and J. Reimann. Schnorr dimension. *Mathematical Structures in Computer Science* 16(5), pp 789-811, 2006.

(An earlier version appeared in: S. B. Cooper, B. Löwe, and L. Torenvliet, editors, *New Computational Paradigms, First Conference on Computability in Europe*, number 3526 in Lecture Notes in Computer Science., pp. 96–105, Berlin, 2005. Springer.)

J. Reimann and F. Stephan. On hierarchies of randomness tests. In *Mathematical Logic in Asia*, Proceedings of the 9th Asian Logic Conference, Novosibirsk, pp. 215-232, World Scientific Publishing, 2006.

W. Merkle, J. Reimann. Selection functions that do not preserve normality. *Theory of Computing Systems*, 39(5):685-697, 2006.
(An earlier version appeared in: *Mathematical foundations of computer science 2003*, volume 2747 of *Lecture Notes in Computer Science*, pages 602–611. Springer, Berlin, 2003.)

W. Merkle, J. Miller, A. Nies, J. Reimann, and F. Stephan. Kolmogorov-Loveland randomness and stochasticity. *Annals of Pure and Applied Logic*, 138(1–3):183–210, 2005.
(An earlier version appeared in: *STACS 2005*, volume 3404 of *Lecture Notes in Computer Science*, pp. 422–433. Springer, Berlin, 2005.)

J. Reimann and F. Stephan. Effective Hausdorff dimension. In *Logic Colloquium '01*, volume 20 of *Lecture Notes Log.*, pp. 369–385. Assoc. Symbol. Logic, Urbana, IL, 2005.

J. Reimann. *Computability and fractal dimension*. Doctoral dissertation, Universität Heidelberg, 2005.

K. Ambos-Spies, W. Merkle, J. Reimann, and S. A. Terwijn. Almost complete sets. *Theoretical Computer Science*, 306(1-3):177–194, 2003.
(An earlier version appeared in: *STACS 2000 (Lille)*, volume 1770 of *Lecture Notes in Computer Science*, pp. 419–430, Berlin, 2000. Springer.)

K. Ambos-Spies, W. Merkle, J. Reimann, and F. Stephan. Hausdorff dimension in exponential time. In *Proceedings of the 16th Annual IEEE Conference on Computational Complexity*, pp. 210–217. IEEE Computer Society, 2001.

K. Ambos-Spies and J. Reimann. Effective Baire category concepts. In *Proceedings of the Sixth Asian Logic Conference (Beijing, 1996)*, pp. 13–29, River Edge, NJ, 1998. World Sci. Publishing.

J. Reimann. Topologische Spiele und resourcenbeschränkte Baire-Kategorie. Diploma Thesis, Universität Heidelberg, 1997.

ARTICLES SUBMITTED

J. Reimann and T. A. Slaman. Effective Randomness for continuous measures. Submitted to *Journal of the American Mathematical Society.*

OTHER PUBLICATIONS

M. Katz and J. Reimann, An Introduction to Ramsey Theory. Book, to appear.

B. Kjos-Hanssen and J. Reimann, Finding subsets of positive measure. http://arxiv.org/abs/1408.1999

R. Downey and J. Reimann. *Algorithmic Randomness*. Scholarpedia, 2(10):2574. (invited and peer-reviewed)

TEACHING

Pennsylvania State University, University Park:

Fall 2017	Math 557 – Mathematical Logic
Summer 2017	Math 140 – Calculus I (online)
Fall 2016	Math 110 – Techniques of Calculus (online, PSU World Campus) Math 574 – Topics in Logic
Summer 2016	Math 110 – Techniques of Calculus (online, PSU World Campus)
Fall 2014	Math 110 – Techniques of Calculus (online, PSU World Campus)
Summer 2014	Math 110 – Techniques of Calculus (online, PSU World Campus)
Spring 2014	Math 110 – Techniques of Calculus (online, PSU World Campus) Math 574 – Topics in Logic
Fall 2012	Math 441 – Matrix Algebra Math 558 – Foundations of Mathematics
Spring 2012	Math 561 – Set Theory
Fall 2011	MASS Course – Introduction to Ramsey Theory The *Mathematics Advanced Study Semesters* (MASS) program at Penn State brings together talented and motivated undergraduate students from the US and beyond to provide

advanced learning combined with research initiation.
See also massramsey2011.wordpress.com

Spring 2011	Math 574 – Topics in Logic
Fall 2010	Math 435 – Basic Abstract Algebra

University of California, Berkeley

Spring 2010	Math 135 – Incompleteness and Undecidability
Fall 2009	Math 227A – Theory of Recursive Functions Math 125A – Mathematical Logic
Spring 2009	Math 225B – Metamathematics
Fall 2008	Math 104 – Introduction to Analysis Math 125A – Mathematical Logic
Spring 2008	Math 104 – Introduction to Analysis
Fall 2007	Math 104 – Introduction to Analysis Math 110 – Linear Algebra
Spring 2007	Math 185 – Introduction to Complex Analysis
Fall 2006	Math 104 – Introduction to Analysis

INDIVIDUAL SUPERVISION AND MENTORING

At Penn State, I currently supervise PhD student Mingyang Li.

I supervised PhD student John Pardo (PhD August 2017, Thesis: *Randomness Of Restricted Value Martingales, Selection Rules, And Graph Sequences*)

From 2010-2013, I co-supervised graduate students Phil Hudelson and Noopur Pathak.

Moreover, I supervised and am currently supervising several master's theses, undergraduate research projects and honors theses, as listed below.

August 2015 – present	Master's papers by Duane Graysay, Devesh Jha, Samuel Aney
January 2015 – present	Patrick Nicodemus, honors thesis Topic: *Computability of graph limits*

June 2014 – Dec. 2015	Ryan Wasson, master's thesis Topic: *Data compression and fractal dimension*
July 2013 – May 2015	Xingyu Zhang, honors thesis Topic: *Ramsey Theory and graph metrics,*
Fall 2013	Yikun Zhou, Topic: *Compression-based estimators for fractal dimensions*
July 2011 – May 2012	Qiyuan Li, honors thesis Topic: *Fractal Geometry and Algorithmic Information Theory*

At the University of California, Berkeley, I supervised the following independent studies and seminars.

Fall 2009	Math 299 – Reading Course for Graduate Students Topic: *Recent papers on algorithmic randomness*
Spring 2009	Math 196 – Honors Thesis (Alexander Kudlick) Topic: *Maharam's Problem* Math 199 – Independent Study and Research (Sarah Brodsky) Topic: *Measure Theory*
Fall 2008	Math 199 – Independent Study and Research Topic: *Compactness and Ultrafilters*
Spring 2007	Math 24 – Freshmen Seminar Topic: *Randomness*

At the University of Heidelberg, I supervised two Diploma theses (comparable to a master's thesis)

Theresa Fahrenberger (completed 2004)
Heiner Violet (completed 2005)

PROFESSIONAL MEMBERSHIPS

American Mathematical Society

Association for Symbolic Logic

Deutsche Vereinigung für Mathematische Logik und für Grundlagenforschung in den exakten Wissenschaften (DVMLG)

PROFESSIONAL ACTIVITIES AND SERVICE

Referee for the following journals:

Advances in Mathematics
American Mathematical Monthly
Annals of Pure and Applied Logic
Archive for Mathematical Logic
Bulletin of Symbolic Logic
Information and Computation
Journal of Complexity
Journal of Logic and Analysis
Journal of Logic and Computation
Journal of Symbolic Logic
Logical Methods in Computer Science

Notre Dame Journal of Formal Logic
Mathematical Logic Quarterly
MathSciNet
Proceedings of the London Mathematical Society
Theoretical Computer Science
Theory of Computing Systems
Transactions on Computation Theory

Scientific Program Committee for the following conferences:

Winter meeting of the Association for Symbolic Logic, San Diego, CA, 2018 (chair)
Annual meeting of the Association for Symbolic Logic, Waterloo, Canada, 2013
Annual meeting of the Association for Symbolic Logic, Madison, WI, 2012
Computability, Complexity, and Randomness 2011, Cape Town, South Africa

Organizing Committee for the following conferences:
Colloquium Logicum, Heidelberg, 2004 Computability and Logic, Heidelberg, 2003
Computability and Randomness, Heidelberg, 2003
Computability and Models, Heidelberg, 2001

Co-organizer of a special session on Computability, Annual meeting of the Association for Symbolic Logic, Madison, WI, 2012

Chair, Association for Symbolic Logic Committee on Translations, January 2016 - present

Installation and administration of WebWork, an open source online homework system (see http://webwork.maa.org), for the Department of Mathematics at Penn State, Fall 2013 – present.

Pilot project on Gradarius, an online step-by-step problem solving platform for Calculus instruction (see http://gradarius.com), Summer 2016 - present.